CLAIMS

What is claimed is:

1. A method for temporal dithering of a light emitting diode ("LED") indicator, comprising the steps of:

initializing the LED indicator to display a first color of a color palette;

during each cycle of a preset cycling rate, cycling the LED indicator display color between the first color and one or more selected colors of the color palette, wherein the LED indicator is caused to display in turn the first color and each selected color of the color palette for a preset portion of each cycle determined to result in a perceived display color at the LED indicator; and

repeating the cycling step to maintain the perceived display color at the LED indicator.

2. The method of Claim 1, wherein the LED indicator is a bi-color LED indicator and wherein the color palette comprises a red color and a green color.

3. The method of Claim 1, wherein the LED indicator is a tri-color LED indicator and wherein the color palette comprises a red color, a green color and a blue color.

4. The method of Claim 1, wherein the preset cycling rate is selected to result in the perceived display color selected by the cycling of the LED indicator display color.

5. The method of Claim 4, wherein the preset cycling rate is 460 kHz.

6. The method of Claim 1, wherein each cycle of the preset cycling rate comprises a number of equal discrete time periods set by selection of a counter, wherein the number of equal discrete time periods is equal to the range of the counter.

7. The method of Claim 6, wherein each preset portion of each cycle during which the first color and each of the one or more selected colors is displayed comprises one or more of the equal discrete time periods, and wherein the size of the preset portion for each of the first color and the one or more selected colors is set to result in a perceived display color at the LED indicator.

8. The method of Claim 7, wherein each displayed color can have a different size preset portion of each cycle during which it is displayed at the LED indicator.

9. The method of Claim 8, wherein the sum of the preset portions for all displayed colors is equal to the number of equal discrete time periods.

10. The method of Claim 1, wherein the first color can be any color of the color palette, and wherein the color palette includes no color displayed at the LED indicator.

11. The method of Claim 1, wherein the perceived display color is the blended sum of the first and the one or more selected colors displayed at the LED indicator as perceived by a human observer.

12. The method of Claim 1, wherein the perceived display color lies on the color spectrum between the lowest frequency and the highest frequency colors in the color palette.

13. The method of Claim 1, wherein the LED indicator is a seven-segment LED indicator.

14. The method of Claim 1, further comprising the step of changing the perceived display color to a new perceived display color, wherein changing the perceived display color comprises:

adjusting the size of the preset portion of each cycle allotted to each of the first color and the one or more selected colors for display, wherein the size of each preset portion is determined to result in the new perceived display color; and

repeating the cycling step using the adjusted preset portion sizes to maintain the new perceived display color at the LED indicator.

15. The method of Claim 14, wherein the step of changing the perceived display color is manually initiated.

16. The method of Claim 14, wherein the step of changing the perceived display color is automatically initiated in response to a changing condition.

17. The method of Claim 16, wherein the changing condition is an exceeded limit of a parameter associated with the LED indicator.

18. A system for temporal dithering of an indicator, comprising:

a light emitting diode ("LED") indicator operable to display a light color;

a temporal dithering logic operable to drive the LED; and

an algorithm operable to control the temporal dithering logic and cause the LED indicator to sequentially display one or more light colors from a color palette associated with the LED indicator in a pattern determined to result in a perceived display color at the LED indicator.

19. The system of Claim 18, wherein the algorithm comprises computer-executable software instructions operable to control the temporal dithering logic, and wherein sequentially displaying the one or more light colors from a color palette at the LED indicator comprises:

initializing the LED indicator to display a first light color of the color palette;

during each cycle of a preset cycling rate, cycling the LED indicator display color between the first color and one or more selected colors of the color palette, wherein the LED indicator is caused to display in turn the first color and each selected color of the color palette for a preset portion of each cycle determined to result in a perceived display color at the LED indicator; and

repeating the cycling step to maintain the perceived display color at the LED indicator.

20. The system of Claim 19, wherein the preset cycling rate is selected to result in the perceived display color selected by the cycling of the LED indicator display color.

21. The system of Claim 20, wherein the preset cycling rate is 460 kHz.

22. The system of Claim 19, wherein each cycle of the preset cycling rate comprises a number of equal discrete time periods set by selection of a counter, wherein the number of equal discrete time periods is equal to the range of the counter.

23. The system of Claim 22, wherein each preset portion of each cycle during which the first color and each of the one or more selected colors is displayed comprises one or more of the equal discrete time periods, and wherein the size of the preset portion for each of the first color and the one or more selected colors is set to result in a perceived display color at the LED indicator.

24. The system of Claim 23, wherein each displayed color can have a different size preset portion of each cycle during which it is displayed at the LED indicator.

25. The system of Claim 24, wherein the sum of the preset portions for all displayed colors is equal to the number of equal discrete time periods.

26. The system of Claim 19, wherein the first color can be any color of the color palette, and wherein the color palette includes no color displayed at the LED indicator.

27. The system of Claim 19, wherein the perceived display color is the blended sum of the first and the one or more selected colors displayed at the LED indicator as perceived by a human observer.

28. The system of Claim 19, wherein the algorithm further comprises computer-executable software instructions operable to change the perceived display color to a new perceived display color, wherein changing the perceived display color comprises:

adjusting the size of the preset portion of each cycle allotted to each of the first color and the one or more selected colors for display, wherein the size of each preset portion is determined to result in the new perceived display color; and

repeating the cycling step using the adjusted preset portion sizes to maintain the new perceived display color at the LED indicator.

29. The system of Claim 28, wherein the step of changing the perceived display color is manually initiated.

30. The system of Claim 28, wherein the step of changing the perceived display color is automatically initiated in response to a changing condition.

31. The system of Claim 30, wherein the changing condition is an exceeded limit of a parameter associated with the LED indicator.

32. The system of Claim 18, wherein the perceived display color lies on the color spectrum between the lowest frequency and the highest frequency light colors in the color palette.

33. The system of Claim 18, wherein the LED indicator is a seven-segment LED indicator.

34. The system of Claim 18, wherein the LED indicator is a bi-color LED indicator and wherein the color palette comprises a red color and a green color.

35. The system of Claim 18, wherein the LED indicator is a tri-color LED indicator and wherein the color palette comprises a red color, a green color and a blue color.

36. The system of Claim 18, wherein the temporal dithering logic comprises:

a counter, operable to produce a counter output signal;

a mulitplexer, operable to produce a multiplexer output signal for selecting from the color palette the light color displayed at the LED indicator;

an adder operable to receive the counter output signal and to reset the counter when the counter output signal reaches a maximum value; and

a comparator operable to:

receive and compare the counter output signal and the multiplexer output signal;

provide a driving signal to the LED indicator to cause the LED indicator to display the selected light color as determined by the multiplexer output signal; and

if the counter output signal and the multiplexer output signal are of equal value, produce a latch signal to cause the driving signal value to change to select a next light color from the color palette for display at the LED indicator.

37. The system of Claim 36, wherein the counter is an 8-bit counter.

38. The system of Claim 36, wherein the counter comprises two or more counters communicatively connected and operable to provide a multi-bit output.

39. The system of Claim 36, wherein the multiplexer is an 8 bit-multiplexer.

40. The system of Claim 36, wherein the multiplexer comprises two or more multiplexers communicatively connected and operable to provide a multi-bit output.

41. The system of Claim 36, wherein the driving signal from the comparator to the LED indicator is an 8-bit signal.

42. The system of Claim 36, wherein the counter maximum value is the highest digital value the counter is capable of counting.

43. The system of Claim 18, further comprising means for changing the perceived display color at the LED indicator based on a changing condition.

44. The system of Claim 43, wherein the changing condition is an exceeded limit of a parameter associated with the LED indicator.

45. The system of Claim 18, further comprising:

a memory for storing the algorithm; and

a power source for powering the LED indicator, the memory and the temporal dithering logic.

46. An apparatus for temporal dithering of a light emitting diode ("LED") indicator, the apparatus comprising:

a processing module; and

a memory operably coupled to the processing module, wherein the memory includes operational instructions that cause the processing module to:

initialize the LED indicator to display a first color of a color palette;

during each cycle of a preset cycling rate, cycle the LED indicator display color between the first color and one or more selected colors of the color palette, wherein the LED indicator is caused to display in turn the first color and each selected color of the color palette for a preset portion of each cycle determined to result in a perceived display color at the LED indicator; and

repeat the cycling step to maintain the perceived display color at the LED indicator.

47. The apparatus of Claim 46, wherein the LED indicator is a bi-color LED indicator and wherein the color palette comprises a red color and a green color.

48. The apparatus of Claim 46, wherein the LED indicator is a tri-color LED indicator and wherein the color palette comprises a red color, a green color and a blue color.

49. The apparatus of Claim 46, wherein the preset cycling rate is selected to result in the perceived display color selected by the cycling of the LED indicator display color.

50. The apparatus of Claim 49, wherein the preset cycling rate is 460 kHz.

51. The apparatus of Claim 46, wherein each cycle of the preset cycling rate comprises a number of equal discrete time periods set by selection of a counter, wherein the number of equal discrete time periods is equal to the range of the counter.

52. The apparatus of Claim 51, wherein each preset portion of each cycle during which the first color and each of the one or more selected colors is displayed comprises one or more of the equal discrete time periods, and wherein the size of the preset portion for each of the first color and the one or more selected colors is set to result in a perceived display color at the LED indicator.

53. The apparatus of Claim 52, wherein each displayed color can have a different size preset portion of each cycle during which it is displayed at the LED indicator.

54. The apparatus of Claim 53, wherein the sum of the preset portions for all displayed colors is equal to the number of equal discrete time periods.

55. The apparatus of Claim 46, wherein the first color can be any color of the color palette, and wherein the color palette includes no color displayed at the LED indicator.

56. The apparatus of Claim 46, wherein the perceived display color is the blended sum of the first and the one or more selected colors displayed at the LED indicator as perceived by a human observer.

57. The apparatus of Claim 46, wherein the perceived display color lies on the color spectrum between the lowest frequency and the highest frequency colors in the color palette.

58. The apparatus of Claim 46, wherein the operational instructions further comprise operational instructions that cause the processing module to change the perceived display color to a new perceived display color, wherein changing the perceived display color comprises:

adjusting the size of the preset portion of each cycle allotted to each of the first color and the one or more selected colors for display, wherein the size of each preset portion is determined to result in the new perceived display color; and

repeating the cycling step using the adjusted preset portion sizes to maintain the new perceived display color at the LED indicator.

59. The apparatus of Claim 58, changing the perceived display color is automatically initiated in response to a changing condition.

60. The apparatus of Claim 59, wherein the changing condition is an exceeded limit of a parameter associated with the LED indicator.